


WEB SOIL SURVEY

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All NRCS Sites


Browse by Subject

- Soils Home
- National Cooperative Soil Survey (NCSS)
- Archived Soil Surveys
- Status Maps
- Official Soil Series Descriptions (OSD)
- Soil Series Extent Mapping Tool
- Soil Data Mart
- Geospatial Data Gateway
- eFOTG
- National Soil Characterization Data
- Soil Geochemistry Spatial Database
- Soil Quality
- Soil Geography

The simple yet powerful way to access and use soil data.




Welcome to Web Soil Survey (WSS)



Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Three Basic Steps

1 Define.



Area of Interest (AOI)

[Use the Area of Interest tab](#) to define your area of interest.

I Want To...

- Start Web Soil Survey (WSS)
- Know the requirements for running Web Soil Survey
- Know whether my web browser works with Web Soil Survey
- Know the Web Soil Survey hours of operation
- Find what areas of the U.S. have soil data

Announcements/Events

- Web Soil Survey 2.0 has been released! [View description of new features.](#)

I Want Help With...

- How to use Web Soil Survey
- Known problems and workarounds
- Frequently Asked Questions

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Navigate by Range, Township, and Section

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Back Address Go Links Windows Marketplace

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Natural Resources Conservation Service

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Area of Interest (AOI) Soil Map Soil Data Explorer Shopping Cart

Quick Navigation

Navigate By...

Address

State and County

Soil Survey Area

Latitude and Longitude

PLSS (Section, Township, Range)

View ?

State North Dakota

Principal Meridian Fifth Principal

View Meridian Map

Section 8

Township 148

Range 80

North

South

East

West

Show Public Land Survey Layer in Map ☒

Area of Interest Interactive Map

Legend

View Extent Continental U.S.

Scale (not to scale)

0 18 1874ft

17TH ST. NW

16TH ST. NW

17TH AVE. NW

16TH AVE. NW

CO HWY 8

16TH ST. NW

17

18

16

5

4

7

6

8

9

Crooked Lake

McLean

T148N R80W

North Dakota

Done Trusted sites

Navigate to an are of interest using one of several Federal land categories; BLM field office, Department of Defense installation, U.S. forest Service unit, or a National Park.

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Back Address Go Links Windows Marketplace

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Area of Interest (AOI) Soil Map Soil Data Explorer Shopping Cart

Quick Navigation

Navigate By...

- Address
- State and County
- Soil Survey Area
- Latitude and Longitude
- PLSS (Section, Township, Range)
- Bureau of Land Management
- Department of Defense
- Forest Service
- National Park Service**

View

State: North Dakota

Park Name: Theodore Roosevelt National Park

Park Code: THRO - Theodore Roosevelt National Park

Show National Park Service Layer in Map: ☒

View

Hydrologic Unit

Click here to begin

Area of Interest Interactive Map

View Extent: Continental U.S. Scale: (not to scale)

start Microsoft PowerPoint ... 2 Internet Explorer 8:52 AM

***The shifted AOI boundary has been corrected.**

***To start over after beginning to draw the AOI, press the Escape key on your key board with out lifting the mouse button.**

Area of Interest (AOI)

Soil Map

Soil Data Explorer

Shopping Cart

Quick Navigation

Navigate By...

Address

State and County

Soil Survey Area

Latitude and Longitude

PLSS (Section, Township, Range)

View

State

Principal Meridian

Fifth Principal

View Meridian Map

Section

24

Township

86

North

South

Range

26

East

West

Show Public Land Survey Layer in Map

View

Bureau of Land Management

Department of Defense

Forest Service

National Park Service

Hydrologic Unit

Area of Interest Interactive Map

View Extent

Scale

Creating AOI...

23

24

Iowa

Hamilton

T86N R25W

T86N R26W

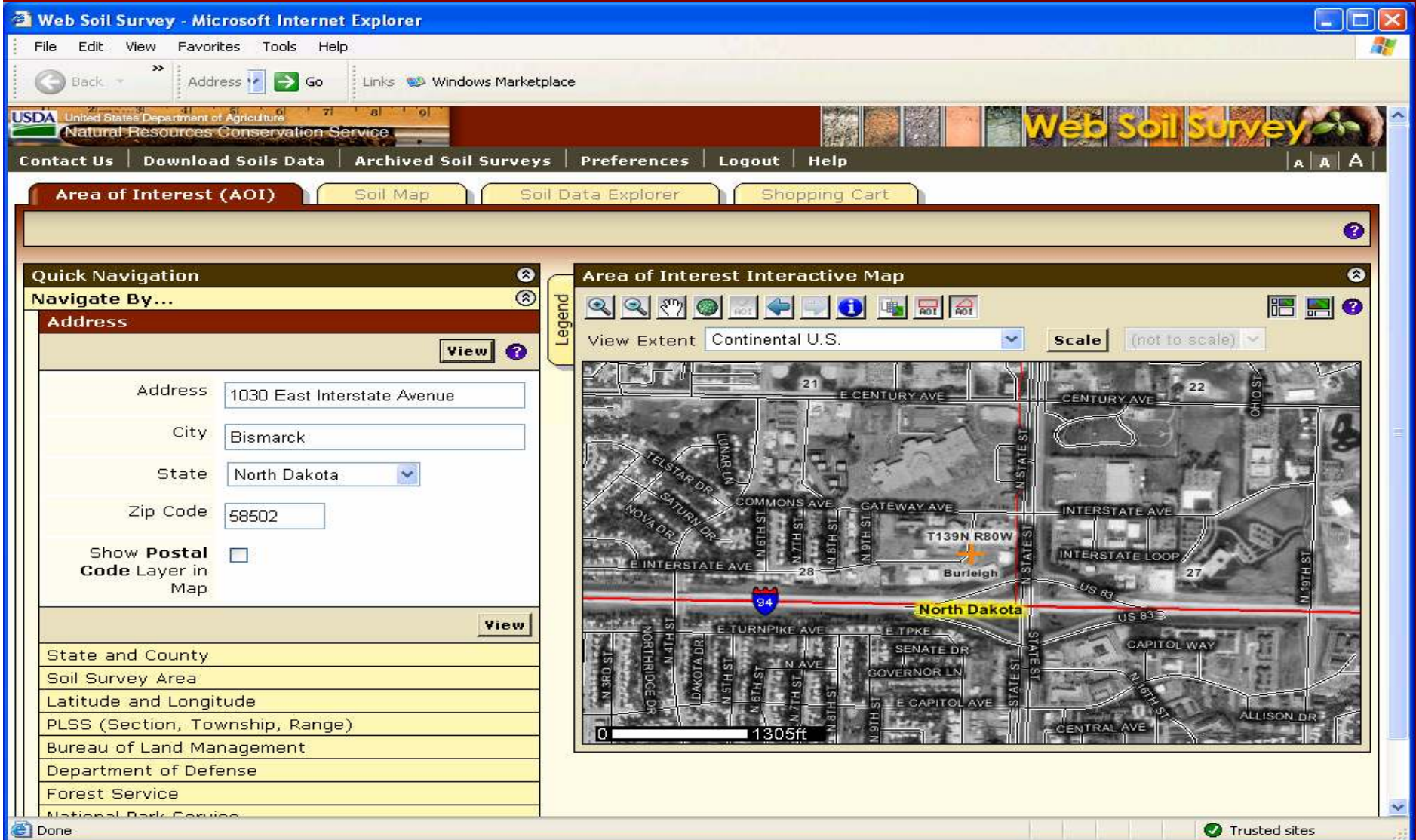
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Location Marker – When you enter an address or latitude, a point marker appears as orange/red.



In addition to viewing your maps against aerial photography, now you can view you maps against a topographic backdrop.

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Back Address Go Links Windows Marketplace

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Area of Interest (AOI) Soil Map Soil Data Explorer Shopping Cart

Quick Navigation

Navigate By...

Address

State and County

Soil Survey Area

Latitude and Longitude

PLSS (Section, Township, Range)

View

State North Dakota

Principal Meridian Fifth Principal

View Meridian Map

Section 8

Township 148

Range 80

North

South

East

West

Show Public Land Survey Layer in Map

Area of Interest Interactive Map

View Extent Continental U.S.

Legend

Map Legend

- ☒ National Park Service
- ☐ Tennessee Valley Authority
- ☒ Water Features
 - ☒ Water
 - ☒ Oceans
 - ☒ Streams and Canals
 - ☐ 8-Digit Hydrologic Units
- ☒ Transportation
 - ☒ Rails
 - ☒ Roads
 - Interstate Highways
 - US Routes
 - State Highways
 - Local Roads
 - Other Roads
- ☒ Background (only one is visible at a time)
 - ☐ Aerial Photography
 - ☒ Topographic Map
 - ☒ Shaded Relief

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Click on the map unit name to display a “Map Unit Description” in a floating window.

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Area of Interest (AOI) **Soil Map** Soil Data Explorer

Map Unit Legend

McLean County, North Dakota (ND055)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GaA	Grail silty clay loam, 0 to 2 percent slopes	6.2	1.6%
MIC	Max-Zahl loams, 6 to 9 percent slopes	170.5	43.1%
MID	Max-Zahl loams, 9 to 15 percent slopes	14.0	3.5%
Pa	Parnell silty clay loam	11.4	2.9%
Pe	Parnell silty clay loam, very wet	1.4	0.3%
W	Water (water areas >40 acres in size)*	86.1	21.8%
WoB	Williams-Bowbells loams, 3 to 6 percent slopes	103.3	26.1%

Soil Map

Map Unit Description

McLean County, North Dakota

WoB—Williams-Bowbells loams, 3 to 6 percent slopes

Map Unit Setting

Elevation: 1,600 to 2,500 feet
Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 110 to 130 days

Map Unit Composition

Williams and similar soils: 60 percent
Bowbells and similar soils: 30 percent
Minor components: 10 percent

Description of Williams

Setting

Landform: Rises
Landform position (two-dimensional): Backslope, summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Properties and qualities

Slope: 3 to 6 percent
Surface area covered with stones and boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

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This tab allows you to edit layer properties such as road labels, AOI hash marks and change the transparency level on ratings maps.

Area of Interest (AOI) Soil Map Soil Data Explorer Shopping Cart

View Soil Information By Use: All Uses Printable Version Add to Shopping Cart

Legend

Map Legend

- ☒ Area of Interest (AOI)
 - ☒ Area of Interest (AOI)
- ☒ Soils
 - ☐ Soil Survey Areas
 - ☒ Soil Map Units
 - ☒ Soil Ratings
 - ☒ Not prime farmland
 - All areas are prime farmland
 - Prime farmland if drained
 - Prime farmland if protected from flooding or not frequently flooded during the growing season
 - Prime farmland if irrigated
 - Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
 - Prime farmland if irrigated and drained
 - Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
 - Prime farmland if subsoiled, completely

Right-click on Soil Ratings and select Edit Layer Properties

Map — Farmland Classification

Scale: 1:7,950 ± 1 %

0 989ft

Tables — Farmland Classification — Summary By Map Unit

Summary by Map Unit — Hamilton County, Iowa

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6	OKOBOJI SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES	Farmland of statewide importance	2.6	1.9%
27B	TERRIL LOAM, 2 TO 5 PERCENT SLOPES	All areas are prime farmland	0.5	0.4%
55	NICOLLET LOAM, 1 TO 3 PERCENT SLOPES	All areas are prime farmland	5.3	4.0%

Map — Farmland Classification

Legend

Scale ± 1 %

Transparency

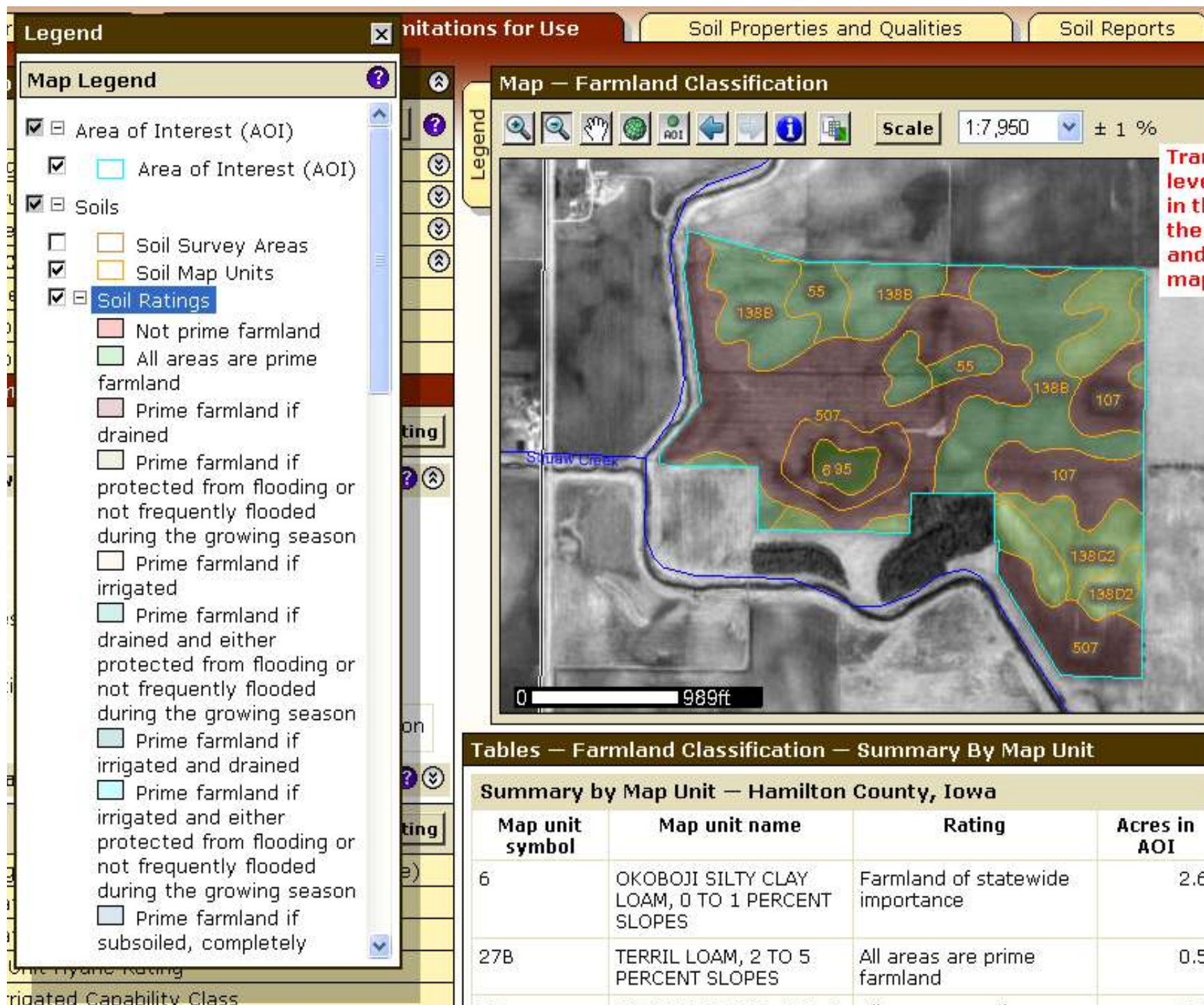
0 0.5 1.0

0.8

Cancel OK

0 989ft

In the Layer Properties dialog, type a number that corresponds with the amount of transparency you would like applied to the image.



Custom Soil Resource Reports

“Add to Shopping Cart”

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Area of Interest (AOI) Soil Map Soil Data Explorer Shopping Cart

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Intro to Soils Suitabilities and Limitations for Use Soil Properties and Qualities Soil Reports

Suitabilities and Limitations Ratings

Open All Close All

Building Site Development

- Corrosion of Concrete
- Corrosion of Steel
- Dwellings With Basements
- Dwellings Without Basements

Construction Materials

- Gravel Source (MN)
- Sand Source
- Topsoil Source

Disaster Recovery Planning

- Catastrophic Mortality, Large Animal Disposal, Pit
- Catastrophic Mortality, Large Animal Disposal, Trench

Land Classifications

- Conservation Tree and Shrub Group
- Ecological Site ID
- Ecological Site Name
- Farmland Classification
- Forage Suitability Group ID (Component Table)
- Hydric Rating by Map Unit
- Irrigated Capability Class
- Irrigated Capability Subclass
- Nonirrigated Capability Class
- Nonirrigated Capability Subclass

Map — Septic Tank Absorption Fields

Scale (not to scale)

0 1248ft

Tables — Septic Tank Absorption Fields — Summary By Map Unit

Summary by Map Unit — McLean County, North Dakota

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
GaA	Grail silty	Very	Grail (90%)	Slow water	6.2	1.6%

Done Trusted sites

Custom Soil Resource Reports compile all your selected interpretations into one polished report.

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Address: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

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Area of Interest (AOI) | Soil Map | Soil Data Explorer | Shopping Cart

Report Properties

Table of Contents

<input checked="" type="checkbox"/> Custom Soil Resource Report for McLean County, North Dakota: Crooked Lake	989 KB
<input checked="" type="checkbox"/> Cover	518 KB
<input checked="" type="checkbox"/> Preface	3 KB
<input checked="" type="checkbox"/> Contents	0 KB
<input checked="" type="checkbox"/> How Soil Surveys Are Made	5 KB
<input checked="" type="checkbox"/> Soil Map	459 KB
<input checked="" type="checkbox"/> Soil Map	383 KB
<input checked="" type="checkbox"/> Map Unit Legend	4 KB
<input checked="" type="checkbox"/> Map Unit Description	72 KB
<input type="checkbox"/> Soil Data Explorer	
<input type="checkbox"/> All Uses	
<input type="checkbox"/> Cropland	
<input type="checkbox"/> Forestland	
<input type="checkbox"/> Hayland/Pastureland	
<input type="checkbox"/> Horticulture	
<input type="checkbox"/> Rangeland	
<input type="checkbox"/> Recreation	
<input type="checkbox"/> Urban Uses	
<input checked="" type="checkbox"/> References	3 KB
<input type="checkbox"/> Glossary	113 KB

Cover

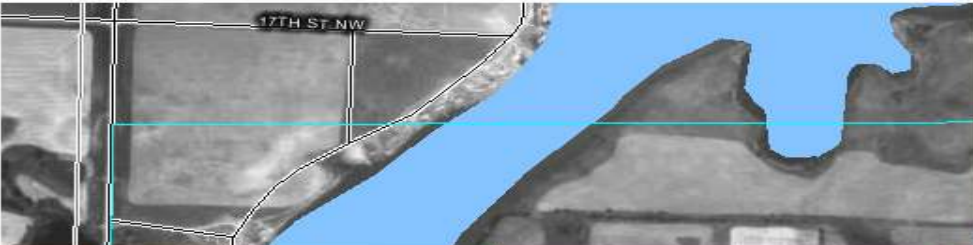
USDA United States Department of Agriculture

NRCS Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants.

Custom Soil Resource Report for McLean County, North Dakota

Crooked Lake



17TH ST. NW

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File Edit Back Address Go Links Windows Marketplace

1 / 41 50% Find

Bookmarks

Options

Cover

Preface

Contents


How Soil Surveys Are Made


Soil Map

- Soil Map
- Legend
- Map Unit Legend

Map Unit Descriptions

- McLean County, North Dakota
 - GaA—Grail silty clay loam, 0 to 2 percent slopes
 - MIC—Max-Z ahl loams, 6 to 9 percent slopes
 - MID—Max-Z ahl loams, 9 to 15 percent slopes
 - Pa—Parnell silty clay


 United States Department of Agriculture

 Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for McLean County, North Dakota

Crooked Lake



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Back Address Go Links Windows Marketplace

3 / 41 50% Find

Bookmarks

- Cover
- Preface
- Contents
- How Soil Surveys Are Made
- Soil Map
 - Soil Map
 - Legend
 - Map Unit Legend
- Map Unit Descriptions
 - McLean County, North Dakota
 - GaA—Grail silty clay loam, 0 to 2 percent slopes
 - MIC—Max-Zahl loams, 6 to 9 percent slopes
 - MID—Max-Zahl loams, 9 to 15 percent slopes
 - Pa—Pamell

Contents

Preface.....	2
How Soil Surveys Are Made.....	4
Soil Map.....	5
Soil Map.....	7
Legend.....	8
Map Unit Legend.....	9
Map Unit Descriptions.....	9
McLean County, North Dakota.....	11
GaA—Grail silty clay loam, 0 to 2 percent slopes.....	11
MIC—Max-Zahl loams, 6 to 9 percent slopes.....	12
MID—Max-Zahl loams, 9 to 15 percent slopes.....	14
Pa—Pamell silty clay loam.....	17
Pe—Pamell silty clay loam, very wet.....	18
W—Water (water areas >40 acres in size).....	19
WoB—Williams-Bowbells loams, 3 to 6 percent slopes.....	20
ZmE—Zahl-Max loams, 9 to 35 percent slopes.....	22
Soil Information for All Uses.....	25
Suitabilities and Limitations for Use.....	25
Land Classifications.....	25
Ecological Site ID: Forage Suitability Group.....	25
Sanitary Facilities.....	28
Septic Tank Absorption Fields.....	28
References.....	40

3

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http://websoilsurvey.sc.egov.usda.gov/wssproduct/mewr4w55ofklbvnp31tll45/GN_00001/Soil_Report. - Microsoft Internet Explorer

File Edit Go To Favorites Help

Back Address Go Links Windows Marketplace

4 / 41 50% Find

Bookmarks

- Cover
- Preface
- Contents
- How Soil Surveys Are Made
- Soil Map
 - Soil Map
 - Legend
 - Map Unit Legend
- Map Unit Descriptions
 - McLean County, North Dakota
 - GaA—Grail silty clay loam, 0 to 2 percent slopes
 - MIC—Max-Z ahl loams, 6 to 9 percent slopes
 - MID—Max-Z ahl loams, 9 to 15 percent slopes
 - Do Dozell

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

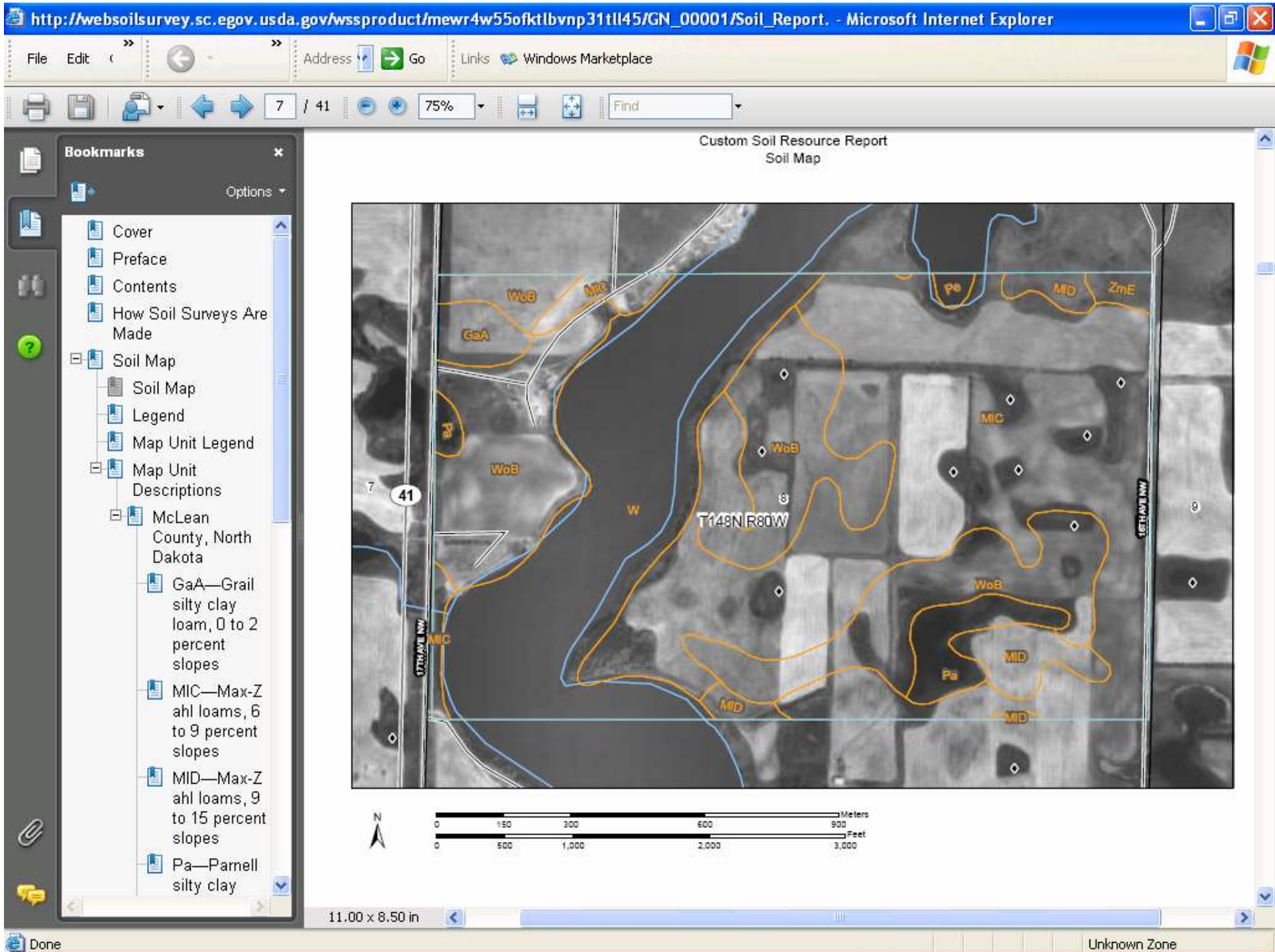
The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

4

Done Unknown Zone



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8 / 41 75% Find

Bookmarks

Options

Cover

Preface

Contents

How Soil Surveys Are Made

Soil Map

Soil Map

Legend

Map Unit Legend

Map Unit Descriptions

McLean County, North Dakota

GaA—Grail silty clay loam, 0 to 2 percent slopes

MIC—Max-Z ahl loams, 6 to 9 percent slopes

MID—Max-Z ahl loams, 9 to 15 percent slopes

Pa—Parnell silty clay

Custom Soil Resource Report

Legend

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spill Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Public Land Survey

Township and Range

Section

Municipalities

Cities

Urban Areas

Federal Land

National Park Service

Water Features

Oceans

Streams and Canals

Transportation

Rails

Roads

Interstate Highways

US Routes

State Highways

Local Roads

Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 14N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: McLean County, North Dakota
Survey Area Data: Version 12, Mar 14, 2007

Date(s) aerial images were photographed: 9/17/1997

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

start

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File Edit Address Go Links Windows Marketplace

9 / 41 75% Find

Bookmarks

Options

Cover

Preface

Contents

How Soil Surveys Are Made

Soil Map

Soil Map

Legend

Map Unit Legend

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Pa—Parnell silty clay

Custom Soil Resource Report

Map Unit Legend

McLean County, North Dakota (ND055)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GaA	Grail silty clay loam, 0 to 2 percent slopes	6.2	1.6%
MIC	Max-Zahl loams, 6 to 9 percent slopes	170.5	43.1%
MID	Max-Zahl loams, 9 to 15 percent slopes	14.0	3.5%
Pa	Parnell silty clay loam	11.4	2.9%
Pe	Parnell silty clay loam, very wet	1.4	0.3%
W	Water (water areas >40 acres in size)*	86.1	21.8%
WoB	Williams-Bowbells loams, 3 to 6 percent slopes	103.3	26.1%
ZmE	Zahl-Max loams, 9 to 35 percent slopes	2.7	0.7%
Totals for Area of Interest (AOI)		395.5	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic

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File Edit Address Go Links Windows Marketplace

11 / 41 75% Find

Bookmarks

- Options
- Cover
- Preface
- Contents
- How Soil Surveys Are Made
- Soil Map
 - Soil Map
 - Legend
 - Map Unit Legend
- Map Unit Descriptions
 - McLean County, North Dakota
 - GaA—Grail silty clay loam, 0 to 2 percent slopes
 - MIC—Max-Z ahl loams, 6 to 9 percent slopes
 - MID—Max-Z ahl loams, 9 to 15 percent slopes
 - Pa—Parnell silty clay

Custom Soil Resource Report

McLean County, North Dakota

GaA—Grail silty clay loam, 0 to 2 percent slopes

Map Unit Setting

- Elevation: 1,600 to 2,500 feet
- Mean annual precipitation: 14 to 17 inches
- Mean annual air temperature: 37 to 45 degrees F
- Frost-free period: 110 to 130 days

Map Unit Composition

- Grail and similar soils: 90 percent
- Minor components: 10 percent

Description of Grail

Setting

- Landform: Swales
- Down-slope shape: Linear
- Across-slope shape: Concave
- Parent material: Clayey alluvium

Properties and qualities

- Slope: 0 to 2 percent
- Depth to restrictive feature: More than 80 inches
- Drainage class: Well drained
- Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
- Depth to water table: More than 80 inches
- Frequency of flooding: None
- Frequency of ponding: None
- Calcium carbonate, maximum content: 15 percent
- Gypsum, maximum content: 2 percent
- Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
- Sodium adsorption ratio, maximum: 2.0
- Available water capacity: High (about 10.6 inches)

Interpretive groups

- Land capability (nonirrigated): 2c
- Ecological site: Clayey (R053BY001ND)
- Other vegetative classification: Clayey Subsoil (G053BY210ND)

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File Edit Address Go Links Windows Marketplace

25 / 41 75% Find

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Ecological Site ID: Forage Suitability Group

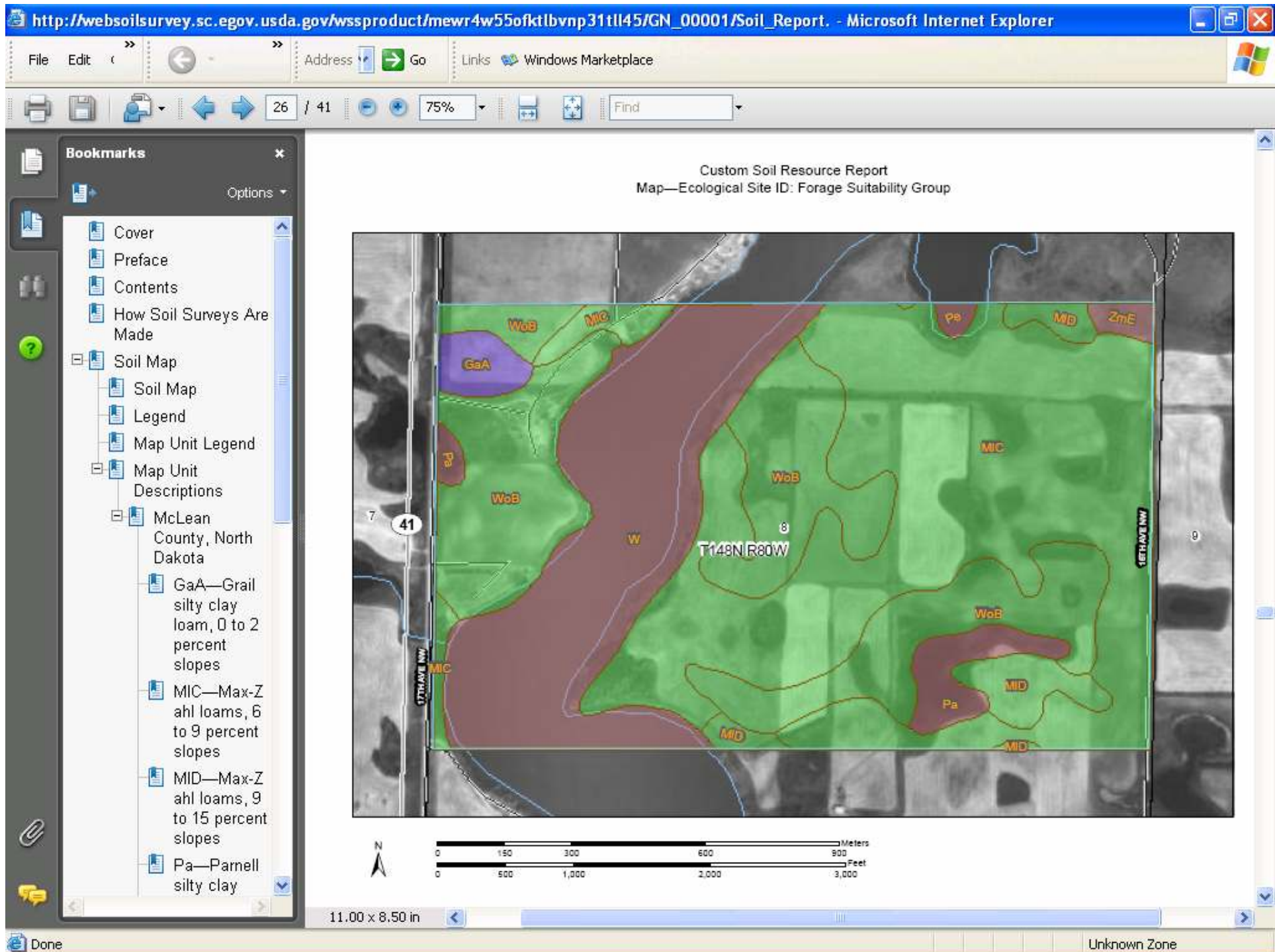
An "ecological site ID" is the symbol assigned to a particular ecological site. An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Bookmarks

- Cover
- Preface
- Contents
- How Soil Surveys Are Made
- Soil Map
 - Soil Map
 - Legend
 - Map Unit Legend
- Map Unit Descriptions
 - McLean County, North Dakota
 - GaA—Grail silty clay loam, 0 to 2 percent slopes
 - MIC—Max-Zahl loams, 6 to 9 percent slopes
 - MID—Max-Zahl loams, 9 to 15 percent slopes
 - Pa—Parnell silty clay

8.50 x 11.00 in

Done Unknown Zone



http://websoilsurvey.sc.egov.usda.gov/wssproduct/mewr4w55ofklbvnp31tl45/GN_00001/Soil_Report. - Microsoft Internet Explorer

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Custom Soil Resource Report

Legend—Ecological Site ID: Forage Suitability Group

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- G053BY000ND
- G053BY100ND
- G053BY210ND
- Not rated or not available

Political Features

Public Land Survey

- Township and Range
- Section

Municipalities

- Cities
- Urban Areas

Federal Land

- National Park Service

Water Features

- Oceans
- Streams and Canals

Transportation

- Rails

Roads

- Interstate Highways
- US Routes

State Highways

- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 14N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: McLean County, North Dakota
Survey Area Data: Version 12, Mar 14, 2007

Date(s) aerial images were photographed: 9/17/1997

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Bookmarks

Options

- Cover
- Preface
- Contents
- How Soil Surveys Are Made
- Soil Map
 - Soil Map
 - Legend
 - Map Unit Legend
- Map Unit Descriptions
 - McLean County, North Dakota
 - GaA—Grail silty clay loam, 0 to 2 percent slopes
 - MIC—Max-Z ahl loams, 6 to 9 percent slopes
 - MID—Max-Z ahl loams, 9 to 15 percent slopes
 - Pa—Parnell silty clay

11.00 x 8.50 in

Done Unknown Zone

http://websoilsurvey.sc.egov.usda.gov/wssproduct/mewr4w55ofktlbvnp31tll45/GN_00001/Soil_Report. - Microsoft Internet Explorer

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Bookmarks

Options

Cover

Preface

Contents

How Soil Surveys Are Made

Soil Map

- Soil Map
- Legend
- Map Unit Legend

Map Unit Descriptions

- McLean County, North Dakota
 - GaA—Grail silty clay loam, 0 to 2 percent slopes
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Custom Soil Resource Report

Table—Ecological Site ID: Forage Suitability Group

Ecological Site ID: Forage Suitability Group— Summary by Map Unit — McLean County, North Dakota

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
GaA	Grail silty clay loam, 0 to 2 percent slopes	G053BY210ND	6.2	1.6%
MIC	Max-Zahl loams, 6 to 9 percent slopes	G053BY100ND	170.5	43.1%
MID	Max-Zahl loams, 9 to 15 percent slopes	G053BY100ND	14.0	3.5%
Pa	Parnell silty clay loam	G053BY000ND	11.4	2.9%
Pe	Parnell silty clay loam, very wet	G053BY000ND	1.4	0.3%
W	Water (water areas >40 acres in size)*	G053BY000ND	86.1	21.8%
WoB	Williams-Bowbells loams, 3 to 6 percent slopes	G053BY100ND	103.3	26.1%
ZmE	Zahl-Max loams, 9 to 35 percent slopes	G053BY000ND	2.7	0.7%
Totals for Area of Interest (AOI)			395.5	100.0%

Rating Options—Ecological Site ID: Forage Suitability Group

Class: Forage Suitability Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

start

Microsoft PowerPoint ...

3 Internet Explorer

11:16 AM

Session timeout increased from 20 to 40 minutes

Area of Interest (AOI) Soil Map **Soil Data Explorer** Shopping Cart

View Soil Information By Use: [Print](#)

Intro to Rangeland Suitabilities and Limitations for Use Soil Properties and Qualities Ecological Site Assessment **Soil Reports**

Soil Reports

[Open All](#) [Close All](#) [?](#)

AOI Inventory [v](#)

Building Site Development [v](#)

Construction Materials [v](#)

Land Classifications [v](#)

Hydrology [v](#)

This [v](#)

Prime [v](#)

Taxonomic Classification of the Soil [v](#)

Recreational Development [v](#)

Soil Chemical Properties [v](#)

Soil Erosion [v](#)

Soil Physical Properties [v](#)

Soil Qualities and Features [v](#)

Vegetative Productivity [v](#)

Waste Management [v](#)

Water Features [v](#)

Water Management [v](#)

Soil Map

[+](#) [-](#) [Hand](#) [AOI](#) [Back](#) [Forward](#) [Info](#) [Layers](#) [Scale](#) [1:9,290](#)

0 890ft

Warning

! Your Session Is About To Time Out

Due to inactivity, your Web Soil Survey session will time out in **04:09** minutes. Unless you reset your session timeout, you will lose all your work. Press **Reset Session Timeout** to reset your session timeout to 40 minutes.

[Reset Session Timeout](#)

You Speak – We'll Listen

Web Soil Survey

<http://www.websoilsurvey.nrcs.usda.gov/app/>